Learning Stable Stochastic Nonlinear Dynamical Systems

A data-driven identification of dynamical systems requiring only minimal prior knowledge is promising whenever no analytically derived model structure is available, e.g., from first principles in physics. However, meta-knowledge on the system’s behavior is often given and should be exploited: Stability as fundamental property is essential when the model is used for controller design or movement generation. Therefore, this paper proposes a framework for learning stable stochastic systems from data. We focus on identifying a state-dependent coefficient form of the nonlinear stochastic model which is globally asymptotically stable according to probabilistic Lyapunov methods. We compare our approach to other state of the art methods on real-world datasets in terms of flexibility and stability.
Occurences:

- Einrichtungen > Fakultäten > Fakultät für Elektrotechnik und Informationstechnik > Lehrstühle und Professuren > Informationstechnische Regelung (Prof. Hirche) > 2017
- Hochschulbibliographie > 2017 > Fakultäten > Elektrotechnik und Informationstechnik > Informationstechnische Regelung (Prof. Hirche)

entries: